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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/736,736	12/14/2000	Robert Arthur Lee	CU-2418 TFP	8027

7590 04/04/2002

Ladas & Parry
224 South Michigan Avenue
Chicago, IL 60604

EXAMINER
AMARI, ALESSANDRO V

ART UNIT	PAPER NUMBER
2872	

DATE MAILED: 04/04/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/736,736	LEE, ROBERT ARTHUR	
	Examiner	Art Unit	
	Amari, Alessandro V.	2872	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-21 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-21 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☒ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2 .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Priority

1. If applicant desires priority under 35 U.S.C. 119(e) based upon a previously filed copending application, specific reference to the earlier filed application must be made in the instant application. This should appear as the first sentence of the specification following the title, preferably as a separate paragraph. The status of nonprovisional parent application(s) (whether patented or abandoned) should also be included. If a parent application has become a patent, the expression "now Patent No. _____" should follow the filing date of the parent application. If a parent application has become abandoned, the expression "now abandoned" should follow the filing date of the parent application.

If the application is a utility or plant application filed on or after November 29, 2000, any claim for priority must be made during the pendency of the application and within the later of four months from the actual filing date of the application or sixteen months from the filing date of the prior application. See 37 CFR 1.78(a)(2) and (a)(5). This time period is not extendable and a failure to submit the reference required by 35 U.S.C. 119(e) and/or 120, where applicable, within this time period is considered a waiver of any benefit of such prior application(s) under 35 U.S.C. 119(e), 120, 121 and 365(c).A priority claim filed after the required time period may be accepted if it is accompanied by a grantable petition to accept an unintentionally delayed claim for priority under 35 U.S.C. 119(e), 120, 121 and 365(c). The petition must be accompanied by (1) a surcharge under 37 CFR 1.17(t), and (2) a statement that the entire delay

between the date the claim was due under 37 CFR 1.78(a)(2) or (a)(5) and the date the claim was filed was unintentional. The Commissioner may require additional information where there is a question whether the delay was unintentional. The petition should be directed to the Office of Petitions,Box DAC, Assistant Commissioner for Patents, Washington, DC 20231.

2. Acknowledgment is made of applicant's claim for foreign priority based on an application filed in Australia on July 2, 1998. It is noted, however, that applicant has not filed a certified copy of the PP4444 application as required by 35 U.S.C. 119(b).

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-21 are rejected under 35 U.S.C. 102(b) as being anticipated by Lee, PCT WO95/04948.

In regard to claim 1, Lee discloses (see Figure 1-3) a diffractive device having a surface relief structure which, when illuminated by a light source, generates one or more diffraction images which are observable from particular ranges of viewing angles around the device as described on page 2, lines 32-39 and page 3, lines 1-4, including: background diffractive structural elements (4); and interstitial diffractive structural elements (5); wherein the interstitial elements are interspersed between the background elements such that the diffractive action of the background elements is to modulated by

the interstitial elements, with differing interstitial element configuration in differing parts of the surface relief structure producing differing diffraction effects in corresponding parts of the diffraction images as described in page 3, lines 20-30 and page 13, lines 2-17. It should be noted that the definition of interstitial is "related to or situated in the interstices," an interstice being "a space that intervenes between things," (i.e., situated in a space that intervenes between things). (See Merriam-Webster's Collegiate Dictionary, 10th ed., 1999) Therefore, it is clear that the diffractive structural element (5) meets the claimed recitation of an interstitial diffractive structural element.

Regarding claim 2, Lee discloses (see Figure 4) that at least some of the background elements consist of a multiplicity of continuously connected individual ridge or groove segments, with ridge or groove segments in adjacent background elements being arranged in an approximately parallel configuration, and wherein at least some of the interstitial elements consist of individual or bifurcated ridge or groove segments interspersed between the background elements, with interstitial element ridge or groove segments being approximately parallel to ridge or groove segments in adjacent background elements as described on page 7, lines 28-32.

Regarding claim 3, Lee discloses (see Figure 8) that at least some of the background elements are approximately parallel, each consisting of a plurality of discontinuous individual ridge or groove segments, and wherein at least some of the interstitial elements are approximately parallel to each other, each consisting of one or more ridge or groove segments and each being located in a discontinuity in a background element as described on page 9, lines 20-28.

Regarding claim 4, Lee discloses that at least some of the interstitial elements are connected smoothly at each end to a background element as shown in Figure 10.

Regarding claim 5, Lee discloses that at least some of the interstitial elements are oriented generally at right-angles to the general orientation of the background elements as shown in Figure 11.

Regarding claim 6, Lee discloses (see Figures 4 and 8) that at least some of the interstitial elements are connected smoothly to adjacent interstitial elements and/or background elements in one or more of the following ways:

(a) a single interstitial element bifurcates smoothly into two interstitial elements;

(b) two interstitial elements join smoothly into a single interstitial element;

(c) an interstitial element joins smoothly into a background element;

(d) an interstitial element of a particular depth and width transitions smoothly into an interstitial element of a different depth and width;

(e) an interstitial element of a particular shape and/or curvature transitions smoothly into an interstitial element of a different shape and/or curvature;

(f) an interstitial element with a particular angular orientation relative to the background elements joins smoothly to an interstitial element having a different angular orientation as described on page 8, lines 34-39 and page 9, lines 20-28.

Regarding claim 7, Lee discloses (see Figures 8 and 10) that at least some of the background elements are connected smoothly to adjacent background elements and/or interstitial elements in one or more of the following ways:

(a) a single background element bifurcates smoothly into two background elements;

(b) two background elements join smoothly into a single background element;

(c) a background element joins smoothly into an interstitial element (as shown in Figures 8 and 10);

(d) a background element of a particular depth and width transitions smoothly into a background element of a different depth and width;

(e) a background element of a particular shape and/or curvature transitions smoothly into a background element of a different shape and/or curvature;

(f) a background element with a particular angular orientation relative to other background elements joins smoothly to a background element having a different angular orientation.

Regarding claim 8, Lee discloses (see Figures 4, 6-8, 10, 11) that each of the background elements and the interstitial elements has a shape which includes one or more of the following features:

(a) a straight, curved or undulating groove;

(b) a straight, curved or undulating ridge;

(c) an array of dot-shaped indentations or protrusions; or

(d) a polygonally shaped indentation or protrusion

as described on page 3, lines 31-38.

Regarding claim 9, Lee discloses (see Figures 4, 8, 10-11) that the diffraction effects observed in a particular part of the image are determined by the interstitial element configuration in a corresponding part of the surface relief structure, and the interstitial element configuration features include one or more of the following features:

(a) lengths of interstitial elements;

(b) widths of interstitial elements;

(c) depths and/or heights of interstitial elements;

(d) local spatial frequency of interstitial elements;

(e) degree of curvature of interstitial elements;

(f) shape of interstitial elements; and

(g) shapes of joins between adjacent interstitial elements

as described on page 3, lines 5-8, 31-39, page 4, lines 1-8, page 7, lines 28-39 and page 8, lines 1-33.

Regarding claim 10, Lee discloses that between background elements interstitial elements vary continuously in terms of orientation, curvature, thickness and/or shape, the variations being a means by which image information is encoded into the surface relief structure as described on page 4, lines 1-8 and page 7, lines 11-23.

Regarding claim 11, Lee discloses that at least some of the interstitial elements are oriented generally parallel to the background elements as shown in Figures 1, 8 and 10.

Regarding claim 12, Lee discloses (see Figure 11) that at least some of the interstitial elements (14) are arranged in a comb-like configuration, with the teeth of the comb being oriented at right angles or at an angle oblique to the general orientation of the background elements (15) as shown in Figure 11.

Regarding claim 13, Lee discloses (see Figures 1, 7 and 11) that at least some of the interstitial elements are arranged in groups oriented at right angles or obliquely to

the general orientation of the background elements, such that a cross-section through the group has a periodic or sinusoidal shape of many repeating periods or oscillations as described on page 13, lines 13-17.

Regarding claim 14, Lee discloses (see Figures 8 and 10) that at least some interstitial element configurations are designed to create grey-scale or variable image intensity information in the image, and one or more of the following configuration features give rise to the grey-scale or variable image intensity information:

(a) lengths of interstitial elements;

(b) degree of curvature of interstitial elements;

(c) widths of interstitial elements and shapes of joins between adjacent elements;

(d) local slope or angle of interstitial elements

as described on page 10, lines 3-15.

Regarding claim 15, Lee discloses that at least some interstitial element configurations are designed to create colour information in the image as described on page 10, lines 16-35.

Regarding claim 16, Lee discloses (see Figures 1, 4, 6, 8, 10 and 11) that the background elements include one or more of the following configurations:

(a) straight, equally spaced background elements;

(b) straight, variably spaced background elements;

(c) undulating, equally spaced background elements;

(d) undulating, variably spaced background elements;

(e) equally spaced closed or open elliptically shaped background elements;

(f) variably spaced closed or open elliptically shaped background elements;

(g) zig-zag shaped background elements of variable zig or zag angle.

Regarding claim 17, Lee discloses that the surface relief structure generates two or more diffraction images which are observable from different ranges of viewing angles, wherein some regions of the surface relief structure contribute to one of the images, and other regions contribute to another of the images as described on page 2, lines 32-39, page 3, lines 1-4, and page 5, lines 31-39.

Regarding claim 18, Lee discloses that at least some of the interstitial elements have lengths of less than 0.25mm as described on page 7, lines 23-27.

Regarding claim 19, Lee discloses that the background elements have lengths of greater than 0.25mm as described on page 3, lines 5-7.

Regarding claim 20, Lee discloses that the surface relief structure includes between background elements one or more of the following:

(a) small scale text or graphics indented into or protruding from the surface relief structure;

(b) interstitial elements consisting of parallelograms of varying angular orientations indented into the surface relief structure;

(c) diffusely reflecting randomly distributed interstitial elements;

(d) diffusely reflecting trapezoidal interstitial elements

as described on page 7, lines 11-23 and page 14, lines 2-13.

Regarding claim 21, Lee discloses that machine-readable digital information is encoded into the positioning, length, orientation and/or other physical characteristics of

interstitial elements, such that the information may be read by passing a laser over the interstitial elements and analysing and decoding the reflected light as described on page 7, lines 11-23 and page 14, lines 2-13.

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in-
> (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effect under this subsection of a national application published under section 122(b) only if the international application designating the United States was published under Article 21(2)(a) of such treaty in the English language; or
> (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that a patent shall not be deemed filed in the United States for the purposes of this subsection based on the filing of an international application filed under the treaty defined in section 351(a).

6. Claims 1, 2, 8, 9, 11-14, 16, 17 and 20 are rejected under 35 U.S.C. 102(e) as being anticipated by Mowry, Jr. et al. U.S. Patent 5,853,197.

In regard to claim 1, Mowry, Jr. et al. discloses (see Figure 2) a diffractive device having a surface relief structure which, when illuminated by a light source, generates one or more diffraction images which are observable from particular ranges of viewing angles around the device, including: background diffractive structural elements (54, 64); and interstitial diffractive structural elements (58, 68); wherein the interstitial elements are interspersed between the background elements such that the diffractive action of the background elements is to modulated by the interstitial elements, with differing interstitial element configuration in differing parts of the surface relief structure producing differing diffraction effects in corresponding parts of the diffraction images as described in column 2, lines 46-62, column 3, lines 33-47 and column 4, lines 47-65.

Regarding claim 2, Mowry, Jr. et al. discloses (see top left hand corner of Figure 2) that at least some of the background elements consist of a multiplicity of continuously connected individual ridge or groove segments, with ridge or groove segments in adjacent background elements being arranged in an approximately parallel configuration, and wherein at least some of the interstitial elements consist of individual or bifurcated ridge or groove segments interspersed between the background elements, with interstitial element ridge or groove segments being approximately parallel to ridge or groove segments in adjacent background elements.

Regarding claim 8, Mowry, Jr. et al. discloses that each of the background elements and the interstitial elements has a shape which includes one or more of the following features:

(a) a straight, curved or undulating groove;

(b) a straight, curved or undulating ridge;

(c) an array of dot-shaped indentations or protrusions; or

(d) a polygonally shaped indentation or protrusion

as can be seen in Figure 2 as described in column 5, lines 1-8, and 46-49.

Regarding claim 9, Mowry, Jr. et al. discloses that the diffraction effects observed in a particular part of the image are determined by the interstitial element configuration in a corresponding part of the surface relief structure, and the interstitial element configuration features include one or more of the following features:

(a) lengths of interstitial elements;

(b) widths of interstitial elements;

(c) depths and/or heights of interstitial elements;

(d) local spatial frequency of interstitial elements;

(e) degree of curvature of interstitial elements;

(f) shape, of interstitial elements; and

(g) shapes of joins between adjacent interstitial elements

as described in column 5, lines 1-8, and 46-49 and column 6, lines 9-18.

Regarding claim 11, Mowry, Jr. et al. discloses that at least some of the interstitial elements are oriented generally parallel to the background elements as shown in the top left hand corner of Figure 2.

Regarding claim 12, Mowry, Jr. et al. discloses that at least some of the interstitial elements are arranged in a comb-like configuration, with the teeth of the comb being oriented at right angles or at an angle oblique to the general orientation of the background elements as shown in the top left hand corner of Figure 2.

Regarding claim 13, Mowry, Jr. et al. discloses that at least some of the interstitial elements are arranged in groups oriented at right angles or obliquely to the general orientation of the background elements, such that a cross-section through the group has a periodic or sinusoidal shape of many repeating periods or oscillations as shown in the top left hand corner of Figure 2.

Regarding claim 14, Mowry, Jr. et al. discloses that at least some interstitial element configurations are designed to create grey-scale or variable image intensity information in the image, and one or more of the following configuration features give rise to the grey-scale or variable image intensity information:

(a) lengths of interstitial elements;

(b) degree of curvature of interstitial elements;

(c) widths of interstitial elements and shapes of joins between adjacent elements;

(d) local slope or angle of interstitial elements

as described in column 6, lines 19-40.

Regarding claim 16, Mowry, Jr. et al. discloses that the background elements include one or more of the following configurations:

(a) straight, equally spaced background elements;

(b) straight, variably spaced background elements;

(c) undulating, equally spaced background elements;

(d) undulating, variably spaced background elements;

(e) equally spaced closed or open elliptically shaped background elements;

(f) variably spaced closed or open elliptically shaped background elements;

(g) zig-zag shaped background elements of variable zig or zag angle

as shown in Figure 2.

Regarding claim 17, Mowry, Jr. et al. discloses that the surface relief structure generates two or more diffraction images which are observable from different ranges of viewing angles, wherein some regions of the surface relief structure contribute to one of the images, and other regions contribute to another of the images as described in column 4, lines 16-46 and as shown in Figure 1.

Regarding claim 20, Mowry, Jr. et al. discloses (see Figures 1 and 2) that the surface relief structure includes between background elements one or more of the following:

(a) small scale text or graphics indented into or protruding from the surface relief structure;

(b) interstitial elements consisting of parallelograms of varying angular orientations indented into the surface relief structure;

(c) diffusely reflecting randomly distributed interstitial elements;

(d) diffusely reflecting trapezoidal interstitial elements

as described in column 5, lines 46-50.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alessandro V. Amari whose telephone number is (703) 306-0533. The examiner can normally be reached on Monday-Friday from 8:00 am to 5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cassandra Spyrou can be reached on (703) 308-1687. The fax phone numbers for the organization where this application is assigned is (703) 308-7722.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

ava
March 29, 2002

Cassandra Spyrou
Supervisory Patent Examiner
Technology Center 2800